CASE REPORT

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Successful laparoscopic management in a heterotopic tubal pregnancy

Manejo laparoscópico exitoso en un embarazo tubárico heterotópico

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ABSTRACT

Heterotopic pregnancy is defined as the coexistence of an intrauterine and an ectopic gestation. It is an exceptional event in spontaneous conceptions, although assisted reproductive techniques have significantly increased its incidence. Clinical manifestations are often nonspecific, making diagnosis challenging; however, transvaginal ultrasound is considered the method of choice for early detection. Early recognition and timely management of the ectopic pregnancy are essential to preserve maternal health and optimize perinatal outcomes, as they allow for the adequate progression of the intrauterine gestation while reducing associated complications.

We present the case of a 27-year-old woman with no known risk factors, diagnosed at 8 weeks with heterotopic pregnancy following spontaneous conception. She underwent laparoscopic salpingectomy, with histopathological confirmation. The intrauterine pregnancy evolved favorably and was carried to term, culminating at 40 weeks in a vaginal delivery of a healthy newborn, with favorable maternal outcomes.

Keywords: heterotopic pregnancy, prenatal diagnosis, laparoscopy, pregnancy outcome.

RESUMEN

El embarazo heterotópico se define como la coexistencia de una gestación intrauterina con otra ectópica. Es un evento excepcional en concepciones espontáneas, aunque las técnicas de reproducción asistida han incrementado significativamente su incidencia. Sus manifestaciones clínicas suelen ser inespecíficas, lo que dificulta el diagnóstico; no obstante, la ecografía transvaginal constituye el método de elección para la detección precoz. El reconocimiento temprano y el tratamiento oportuno del embarazo ectópico son fundamentales para preservar la salud materna y optimizar los resultados perinatales, al permitir la progresión adecuada de la gestación intrauterina y disminuir complicaciones asociadas. Presentamos el caso de una mujer de 27 años, sin factores de riesgo conocidos, diagnosticada a las 8 semanas con embarazo heterotópico tras concepción espontánea. Fue tratada mediante salpingectomía laparoscópica confirmada por histopatología. La gestación intrauterina evolucionó favorablemente y culminó a las 40 semanas con parto vaginal, obteniéndose un recién nacido sano y madre en buen estado.

Palabras clave: embarazo heterotópico, diagnóstico prenatal, laparoscopía, resultado del embarazo.

Introducción

Heterotopic pregnancy is the simultaneous presence of an intrauterine pregnancy and an ectopic pregnancy. It is rare in the general population, with an estimated spontaneous incidence of 1 in 30,000 pregnancies[(1)]. However, due to the widespread use of assisted reproduction techniques, the incidence has increased to 46 per 30,000 pregnancies[(2)].

The etiology is still unknown, but three main risk factors have been described: 1. Fertility treatment techniques such as the use of ovulation inducers and multiple embryo transfer that occurs during in vitro fertilization treatment; 2. History of tubal surgery such as salpingectomy or salpingostomy; 3. Tubal abnormalities secondary to pelvic inflammatory disease, endometriosis, and a history of ectopic pregnancy or two miscarriages[(3–6)].

Early diagnosis is often challenging because the clinical manifestations are nonspecific[(5)] and serum human chorionic gonadotropin (hCG) levels are not useful due to the coexistence of intrauterine pregnancy[(3,6)].

Therefore, transvaginal ultrasound is considered the method of choice for early diagnosis, with a detection rate ranging from 26.2% to 92.4%[5,7].

During the 5th to 8th weeks of gestation, heterotopic pregnancy can be diagnosed in 76% of cases, between the 9th and 10th weeks in 15% of cases, after the 11th week in 9% of cases[8], and cases during the second trimester have rarely been reported[9,10].

Therefore, upon identification of an intrauterine pregnancy, a comprehensive ultrasound assessment of the adnexa is recommended, particularly in patients presenting risk factors[7], as delayed diagnosis of a heterotopic pregnancy may result in ectopic pregnancy rupture, leading to complications such as hemoperitoneum, hypovolemic shock, and the requirement for blood transfusion[11].

The purpose of managing heterotopic pregnancy should be to preserve the viability of the intrauterine pregnancy and definitively treat the ectopic pregnancy, while minimizing adverse outcomes[12]. Although there is no consensus on the treatment modality for ectopic pregnancy in heterotopic pregnancies, options include expectant management, medical treatment, ultrasound-guided embryo aspiration, and surgical treatment[13,14].

We report a case of a patient diagnosed with spontaneous heterotopic pregnancy during the first trimester of gestation, who underwent laparoscopic management of the ectopic pregnancy and subsequently achieved a favorable perinatal outcome of the intrauterine pregnancy.

Case report

A 27-year-old patient with an unreliable last menstrual period, in her third pregnancy with a history of previous vaginal delivery and uterine curettage for retained abortion, denies assisted fertilization treatment, previous pelvic infections, and relevant surgical treatments.

The patient presented to the emergency department at Dos de Mayo National Hospital with moderate to severe colicky abdominal pain, which had commenced 8 hours prior and worsened when lying supine, accompanied by nausea and vomiting. She denied vaginal bleeding and reported no fever. Ten days earlier, a private transvaginal ultrasound had been performed, revealing a gestational sac measuring 17.4 mm in maximum diameter, containing a 6.2 mm embryo with a heart rate of 114 beats per minute. The right ovary measured 26 × 20 mm and exhibited a corpus luteum, whereas the left ovary measured 25 × 15 mm and appeared unremarkable on ultrasound.

During the physical examination, blood pressure was 100/60 mmHg, heart rate was 102 beats per minute, and temperature was 37 °C. The abdomen presented diffuse pain on superficial palpation and muscle resistance. A vaginal examination revealed an enlarged uterus, painful on movement, and a closed cervix. Laboratory tests showed hemoglobin at 10.9 g/dL, leukocytes at 9557 cells/L, coagulation profile and biochemistry within the normal range, and no B-hCG dosage was performed. Transvaginal ultrasound showed a uterus measuring 11 cm x 6 cm, an intrauterine gestational sac with a 14.8 mm embryo and a heart rate of 168 beats per minute, which correlated to an 8-week gestation. A heterogeneous extraovarian mass measuring 32 × 20 mm with peripheral Doppler flow in a "ring of fire" pattern was identified in the right adnexa. When pressure was applied with the endocavitary transducer, it was evident that the mass did not move with the ovary. Free fluid was also observed in the Douglas pouch, with an estimated volume of approximately 100 mL (Figure 1). Based on the clinical findings consistent with acute abdomen, confirmation of an intrauterine pregnancy, and ultrasound findings highly suggestive of a ruptured ectopic pregnancy, a complicated heterotopic pregnancy was suspected. Given the risk of intra-abdominal bleeding and maternal compromise, it was decided to schedule emergency laparoscopic surgery for diagnostic and therapeutic purposes. Intraoperatively, a pregnant uterus, both ovaries, and left fallopian tube were observed without macroscopic alterations. At the level of the ampulla of the right fallopian tube, a 3 cm diameter violaceous mass with active bleeding and the presence of 500 mL of hemoperitoneum in the abdominal cavity was observed (Figure 2). A right laparoscopic salpingectomy was performed, and the sample was sent for pathological examination (Figure 3).

The patient demonstrated favorable postoperative progress. An obstetric ultrasound confirmed embryonic cardiac activity, and she was

Figure 1. Transvaginal ultrasound. A. The sagittal view shows an intrauterine embryo (*) with free fluid in the Douglas pouch (^). B. The transverse view shows both the embryo (*) and a mass in the right adnexa (#).

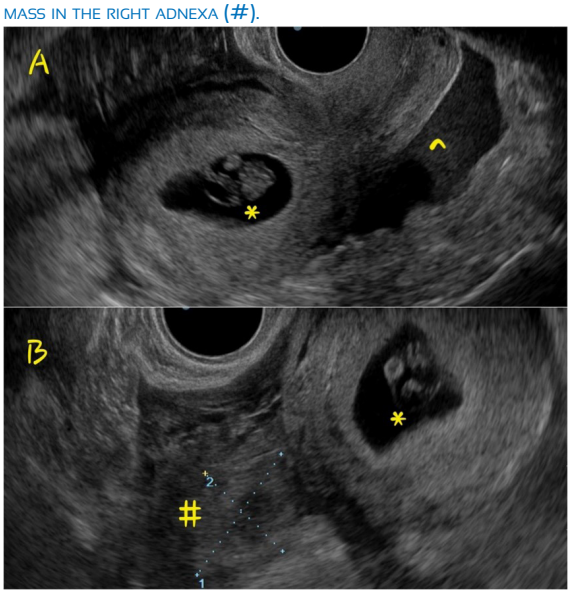

Figure 2. Laparoscopic view of the pelvic area shows a pregnant uterus (*) with hemoperitoneum, right ovary without abnormalities (^), and fallopian tube with ectopic pregnancy in the ampullary portion (#).

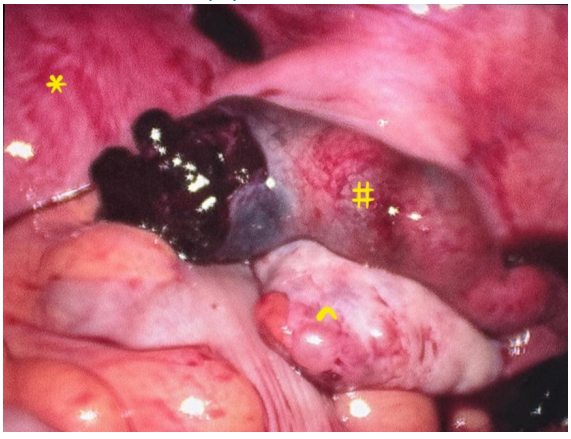

Figure 3. Surgical specimen: right fallopian tube, 7.5 cm long, with ectopic pregnancy in the ampullary portion.

discharged 48 hours after the procedure. Oral micronized progesterone was prescribed until 14 weeks of gestation, and prenatal care was initiated at the hospital.

Two weeks later, she attended the obstetrics outpatient clinic, where histopathological analysis confirmed the diagnosis of tubal ectopic pregnancy (Figure 4). During her prenatal course, ten follow-up visits were conducted, including an ultrasound for aneuploidy screening at 12 weeks and a morphological ultrasound at 20 weeks of gestation, both of which were normal.

At 40 weeks of gestation, she underwent vaginal delivery, resulting in the birth of a live female neonate weighing 3505 g, appropriate for gestational age, with Apgar scores of 9 and 9 at 1 and 5 minutes, respectively. Both maternal and neonatal hospital courses were uneventful, and the patient was discharged 24 hours postpartum.

Discussion

Heterotopic pregnancy is an unusual form of gestation that can be life-threatening if not detected early[11]. Assisted reproductive techniques and damage to the fallopian tubes have been the main risk factors that have increased its incidence. Talbot et al.[15] reported in a review that 71% of cases may have one risk factor, 10% may have three or more factors, and 29% of cases may have no identifiable risk factors. The latter coincides with our reported case, as it was a spontaneously conceived pregnancy without the presence of known risk factors.

Signs and symptoms vary widely, with the most common being abdominal pain (22.5%–82.7%)[8,16] and vaginal bleeding (30%–33.7%) (5,16). However, some patients may be asymptomatic (14.6%–17.5%)[6,16] and others may develop hypovolemic shock (12.5%–33.4%)[5,11]. These characteristics make it difficult to accurately diagnose a heterotopic pregnancy, as the clinical presentation can be attributed to the loss of the intrauterine product or to complications of the ectopic pregnancy[15].

It should be noted that the diagnosis of heterotopic pregnancy requires the use of transvaginal ultrasound, where we observe an intrauter-

Figure 4. Histology shows the fallopian tube with areas of hemorrhage, edema, and foci of decidualization.

ine pregnancy characterized by the presence of a gestational sac in the upper two-thirds of the uterine cavity within the decidualized endometrium and, simultaneously, an ectopic pregnancy that is implanted in an abnormal location, either intrauterine or extrauterine[17].

The ultrasound diagnosis is based on a combination of key findings, such as the presence of an extraovarian adnexal mass, the "tubal ring" sign defined as a hyperechoic ring surrounding an anechoic center, "ring of fire" Doppler flow characterized by intense, low-resistance peripheral vascular flow surrounding an adnexal mass, free fluid in the cavity, and in rare cases, extrauterine embryonic cardiac activity. However, the "ring of fire" lacks specificity, as it can also be observed in the corpus luteum, so it is essential to complement it with the "sliding sign," which assesses the independent mobility of the mass relative to the ovary, as well as with a detailed analysis of the wall of the lesion. The combination of grayscale transvaginal ultrasound, color Doppler, and clinical correlation significantly increases diagnostic accuracy; however, the literature highlights the need for prospective multicenter studies to rigorously validate the usefulness of these findings in the context of heterotopic pregnancy[18,19].

Even so, in some cases, the presence of an adnexal mass can make it difficult to differentiate between ectopic pregnancy and a corpus luteum or hemorrhagic cyst[15].

Therefore, when the clinical picture is nonspecific and the ultrasound findings are unclear, the definitive diagnosis of heterotopic pregnancy can be made by surgical approach in 58.9% to 73.7% of cases, as reported by Tal et al.[8] and Barrenetxea et al.[5].

Lv et al.[12] reported that 76.7% of ectopic pregnancies occurred in the fallopian tubes in a report of 90 cases of heterotopic pregnancy. In our case, laparoscopy confirmed the presence of a ruptured tubal ectopic pregnancy, which had been suspected in the ultrasound evaluation.

The management of heterotopic pregnancy remains controversial, and it is recommended that the treatment approach be individualized, considering the clinical presentation, hemodynamic status, ectopic pregnancy location, mass size, and the goal of preserving the intrauterine pregnancy[16]. Four options are reported in the literature. The first is expectant management, which is indicated in patients without hemodynamic disturbance with a tubal ectopic pregnancy and no signs of rupture or cardiac activity; however, some report that this management has a risk of failure due to continued growth or rupture of the ectopic mass[13,20]. The second, medical management, consists of local injection of methotrexate, potassium chloride, or a combination of both in ectopic pregnancies that may be cervical or interstitial in location, although this option does not always ensure the survival of the intrauterine

pregnancy[21]. The third option is ultrasound-guided embryo aspiration, which is performed with or without embryotoxic drugs. It is a minimally invasive procedure that can be technically difficult as it depends on the location of the ectopic pregnancy[22]. The fourth option is surgical intervention, which can be effective and safe. Chen et al.[14] reported that, in a series of 109 patients with heterotopic pregnancy who required surgery, 56.9% of cases were performed by laparoscopy and 43.1% by laparotomy. They also reported that laparoscopy was associated with shorter surgical duration and a significant reduction in intraoperative blood loss compared to laparotomy.

Regarding complications and perinatal outcomes, Clayton et al.[23] reported that intrauterine gestation in heterotopic pregnancies carries twice the risk of spontaneous abortion and up to ten times the risk of induced abortion compared to singleton intrauterine pregnancies. Conversely, they observed that intrauterine gestation in heterotopic pregnancies did not exhibit complications at birth. These findings are valuable as they allow for the provision of evidence-based preoperative counseling to patients.

In conclusion, heterotopic pregnancy is defined as the simultaneous occurrence of intrauterine and ectopic gestation, a condition that is rare in spontaneous conceptions. It is important to note that the presence of an intrauterine pregnancy may obscure an ectopic pregnancy, creating a diagnostic challenge and potentially delaying management. Consequently, transvaginal ultrasound is considered the method of choice for early detection. Treatment should be individualized, aiming to resolve the ectopic pregnancy while minimizing risk to the intrauterine gestation.

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